



August 09, 2016

Smita Sumbaly Weston Solutions, Inc 1090 King Georges Post Road Edison, NJ 08837

RE: Project: 393

Pace Project No.: 30189561

Dear Smita Sumbaly:

Enclosed are the analytical results for sample(s) received by the laboratory on July 13, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carin a. Ferris

Carin Ferris carin.ferris@pacelabs.com Project Manager

Enclosures

cc: Ben Nwosu, Weston Solutions, Inc.



REPORT OF LABORATORY ANALYSIS



1638 Roseytown Road - Suites 2,3,4 Greensburg, PA 15601 (724)850-5600

CERTIFICATIONS

Project: 393
Pace Project No.: 30189561

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683 Georgia Certification #: C040

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification Missouri Certification #: 235 Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14 Nevada Certification #: PA014572015-1 New Hampshire/TNI Certification #: 2976 New Jersey/TNI Certification #: PA 051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888

New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification

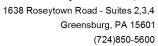
Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8 Utah/TNI Certification #: PA014572015-5 USDA Soil Permit #: P330-14-00213 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 460198 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS





SAMPLE SUMMARY

Project: 393
Pace Project No.: 30189561

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30189561001	N002-BKF001-01	Solid	07/11/16 09:00	07/13/16 10:40
30189561002	N002-BKF002-01	Solid	07/12/16 13:46	07/13/16 10:40
30189561003	N002-CC001-01	Solid	07/10/16 14:00	07/13/16 10:40
30189561004	N002-CC002-01	Solid	07/10/16 11:00	07/13/16 10:40
30189561005	N002-CC002-02	Solid	07/10/16 11:05	07/13/16 10:40
30189561006	RB-N-160710	Water	07/10/16 15:00	07/13/16 10:40

REPORT OF LABORATORY ANALYSIS



SAMPLE ANALYTE COUNT

Project: 393
Pace Project No.: 30189561

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30189561001	N002-BKF001-01	EPA 901.1	MAH	11
		HSL-300	LAL	6
30189561002	N002-BKF002-01	EPA 901.1	MAH	9
		HSL-300	LAL	6
30189561003	N002-CC001-01	EPA 901.1	MAH	9
		HSL-300	LAL	6
30189561004	N002-CC002-01	EPA 901.1	MAH	9
		HSL-300	LAL	6
30189561005	N002-CC002-02	EPA 901.1	MAH	9
		HSL-300	LAL	6
30189561006	RB-N-160710	EPA 903.1	WRR	1
		EPA 904.0	JLW	1
		HSL-300	LAL	6

REPORT OF LABORATORY ANALYSIS



Project: 393
Pace Project No.: 30189561

Method: EPA 901.1

Description: 901.1 Gamma Spec INGROWTH **Client:** Weston Solutions, Inc. (NJ)

Date: August 09, 2016

General Information:

5 samples were analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 901.1 with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS



Project: 393
Pace Project No.: 30189561

Method: EPA 903.1 Description: 903.1 Radium 226

Client: Weston Solutions, Inc. (NJ)

Date: August 09, 2016

General Information:

1 sample was analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS



Project: 393
Pace Project No.: 30189561

Method: EPA 904.0
Description: 904.0 Radium 228

Client: Weston Solutions, Inc. (NJ)

Date: August 09, 2016

General Information:

1 sample was analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

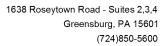
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS





Project: 393
Pace Project No.: 30189561

Method: HSL-300

Description: HSL300(AS) Actinides **Client:** Weston Solutions, Inc. (NJ)

Date: August 09, 2016

General Information:

5 samples were analyzed for HSL-300. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

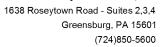
Analyte Comments:

QC Batch: 226882

N2: The lab does not hold TNI accreditation for this parameter.

- BLANK (Lab ID: 1111723)
 - Thorium-228
 - Thorium-230
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236
- N002-BKF001-01 (Lab ID: 30189561001)
 - Thorium-228
 - Thorium-230
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236
- N002-BKF002-01 (Lab ID: 30189561002)
 - Thorium-228
 - Thorium-230
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236
- N002-CC001-01 (Lab ID: 30189561003)
 - Thorium-228
 - Thorium-230

REPORT OF LABORATORY ANALYSIS





Project: 393
Pace Project No.: 30189561

Method: HSL-300

Description: HSL300(AS) Actinides **Client:** Weston Solutions, Inc. (NJ)

Date: August 09, 2016

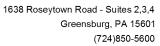
Analyte Comments:

QC Batch: 226882

N2: The lab does not hold TNI accreditation for this parameter.

- N002-CC001-01 (Lab ID: 30189561003)
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236
- N002-CC002-01 (Lab ID: 30189561004)
 - Thorium-228
 - Thorium-230
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236
- N002-CC002-02 (Lab ID: 30189561005)
 - Thorium-228
 - Thorium-230
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236

REPORT OF LABORATORY ANALYSIS





Project: 393
Pace Project No.: 30189561

Method: HSL-300

Description: HSL300(AS) Actinides **Client:** Weston Solutions, Inc. (NJ)

Date: August 09, 2016

General Information:

1 sample was analyzed for HSL-300. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 227833

N2: The lab does not hold TNI accreditation for this parameter.

- BLANK (Lab ID: 1116097)
 - Thorium-228
 - Thorium-230
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236
- RB-N-160710 (Lab ID: 30189561006)
 - Thorium-228
 - Thorium-230
 - Thorium-232
 - U-233/234
 - Uranium-238
 - U-235/236

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS



Project: 393 Pace Project No.: 30189561

Sample: N002-BKF001-01 Lab ID: 30189561001 Collected: 07/11/16 09:00 Received: 07/13/16 10:40 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	0.29898U ± 0.841 (1.067) C:NA T:NA	pCi/g	08/09/16 10:15	14913-49-6	
Bismuth-214	EPA 901.1	0.366 ± 0.139 (0.100) C:NA T:NA	pCi/g	08/09/16 10:15	14733-03-0	
Lead-210	EPA 901.1	1.0909J ± 1.317 (1.678) C:NA T:NA	pCi/g	08/09/16 10:15	14255-04-0	
Lead-212	EPA 901.1	0.079396J ± 0.084 (0.105) C:NA T:NA	pCi/g	08/09/16 10:15	15092-94-1	
Lead-214	EPA 901.1	0.506 ± 0.160 (0.115) C:NA T:NA	pCi/g	08/09/16 10:15	15067-28-4	
Potassium-40	EPA 901.1	0.61331J ± 0.596 (0.856) C:NA T:NA	pCi/g	08/09/16 10:15		
Radium-226	EPA 901.1	0.406 ± 0.125 (0.100) C:NA T:NA	pCi/g	08/09/16 10:15		
Radium-228	EPA 901.1	0.059314U ± 0.085 (0.324) C:NA T:NA	pCi/g	08/09/16 10:15		
Thallium-208	EPA 901.1	0.030704J ± 0.033 (0.076) C:NA T:NA	pCi/g	08/09/16 10:15		
Thorium-234	EPA 901.1	0.33451U ± 0.597 (1.419) C:NA T:NA	pCi/g	08/09/16 10:15		
Uranium-235	EPA 901.1	0.116 ± 0.071 (0.077) C:NA T:NA	pCi/g	08/09/16 10:15		
Thorium-228	HSL-300	0.099 ± 0.093 (0.148) C:NA T:85%	pCi/g	07/28/16 08:00		N2
Thorium-230	HSL-300	0.297 ± 0.140 (0.093) C:NA T:85%	pCi/g	07/28/16 08:00		N2
Thorium-232	HSL-300 HSL-300	0.089 ± 0.075 (0.077) C:NA T:85%	pCi/g	07/28/16 08:00	7440-29-1	N2
U-233/234		0.513 ± 0.203 (0.151) C:NA T:104%	pCi/g	07/27/16 15:42		N2
U-235/236	HSL-300	0.022 ± 0.078 (0.058) C:NA T:104%	pCi/g	07/27/16 15:42		N2
Uranium-238	HSL-300	0.396 ± 0.170 (0.045) C:NA T:104%	pCi/g	07/27/16 15:42		N2

Sample: N002-BKF002-01 Lab ID: 30189561002 Collected: 07/12/16 13:46 Received: 07/13/16 10:40 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	0U ± 0.224 (1.348) C:NA T:NA	pCi/g	08/09/16 10:32	14913-49-6	
Lead-210	EPA 901.1	0.40607U ± 1.727 (2.333) C:NA T:NA	pCi/g	08/09/16 10:32	14255-04-0	
Lead-212	EPA 901.1	0.11621J ± 0.123 (0.146) C:NA T:NA	pCi/g	08/09/16 10:32	15092-94-1	
Potassium-40	EPA 901.1	1.504 ± 1.235 (1.274) C:NA T:NA	pCi/g	08/09/16 10:32	13966-00-2	
Radium-226	EPA 901.1	0.689 ± 0.160 (0.100) C:NA T:NA	pCi/g	08/09/16 10:32	13982-63-3	

REPORT OF LABORATORY ANALYSIS



Project: 393
Pace Project No.: 30189561

Sample: N002-BKF002-01 Lab ID: 30189561002 Collected: 07/12/16 13:46 Received: 07/13/16 10:40 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 901.1	0.203 ± 0.133 (0.197) C:NA T:NA	pCi/g	08/09/16 10:32	15262-20-1	
Thallium-208	EPA 901.1	0.031289J ± 0.033 (0.092) C:NA T:NA	pCi/g	08/09/16 10:32	14913-50-9	
Thorium-234	EPA 901.1	0.35913U ± 0.615 (1.577) C:NA T:NA	pCi/g	08/09/16 10:32	15065-10-8	
Uranium-235	EPA 901.1	0.106 ± 0.098 (0.093) C:NA T:NA	pCi/g	08/09/16 10:32	15117-96-1	
Thorium-228	HSL-300	0.253 ± 0.137 (0.178) C:NA T:89%	pCi/g	07/28/16 08:00	14274-82-9	N2
Thorium-230	HSL-300	0.712 ± 0.218 (0.083) C:NA T:89%	pCi/g	07/28/16 08:00	14269-63-7	N2
Thorium-232	HSL-300	0.310 ± 0.132 (0.065) C:NA T:89%	pCi/g	07/28/16 08:00	7440-29-1	N2
U-233/234	HSL-300	0.687 ± 0.247 (0.208) C:NA T:87%	pCi/g	07/27/16 15:43		N2
U-235/236	HSL-300	0.081 ± 0.086 (0.108) C:NA T:87%	pCi/g	07/27/16 15:43		N2
Uranium-238	HSL-300	0.793 ± 0.259 (0.120) C:NA T:87%	pCi/g	07/27/16 15:43		N2

Sample: N002-CC001-01 Lab ID: 30189561003 Collected: 07/10/16 14:00 Received: 07/13/16 10:40 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	0U ± 0.638 (1.844) C:NA T:NA	pCi/g	08/09/16 10:49	14913-49-6	
Lead-210	EPA 901.1	-4.0118U ± 14.319 (18.050) C:NA T:NA	pCi/g	08/09/16 10:49	14255-04-0	
Lead-212	EPA 901.1	0.593 ± 0.152 (0.129) C:NA T:NA	pCi/g	08/09/16 10:49	15092-94-1	
Potassium-40	EPA 901.1	8.581 ± 1.792 (0.674) C:NA T:NA	pCi/g	08/09/16 10:49	13966-00-2	
Radium-226	EPA 901.1	0.588 ± 0.146 (0.132) C:NA T:NA	pCi/g	08/09/16 10:49	13982-63-3	
Radium-228	EPA 901.1	0.443 ± 0.273 (0.315) C:NA T:NA	pCi/g	08/09/16 10:49	15262-20-1	
Thallium-208	EPA 901.1	0.166 ± 0.070 (0.051) C:NA T:NA	pCi/g	08/09/16 10:49	14913-50-9	
Thorium-234	EPA 901.1	1.3609J ± 2.381 (2.972) C:NA T:NA	pCi/g	08/09/16 10:49	15065-10-8	
Uranium-235	EPA 901.1	0.032751U ± 0.106 (0.132) C:NA T:NA	pCi/g	08/09/16 10:49	15117-96-1	
Thorium-228	HSL-300	0.558 ± 0.210 (0.206) C:NA T:91%	pCi/g	07/28/16 08:00	14274-82-9	N2
Thorium-230	HSL-300	0.439 ± 0.172 (0.122) C:NA T:91%	pCi/g	07/28/16 08:00	14269-63-7	N2
Thorium-232	HSL-300	0.274 ± 0.128 (0.037) C:NA T:91%	pCi/g	07/28/16 08:00	7440-29-1	N2

REPORT OF LABORATORY ANALYSIS



Project: 393
Pace Project No.: 30189561

Sample: N002-CC001-01 Lab ID: 30189561003 Collected: 07/10/16 14:00 Received: 07/13/16 10:40 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
U-233/234	HSL-300	0.556 ± 0.235 (0.191) C:NA T:77%	pCi/g	07/27/16 09:34		N2
U-235/236	HSL-300	0.052 ± 0.096 (0.132) C:NA T:77%	pCi/g	07/27/16 09:34		N2
Uranium-238	HSL-300	0.336 ± 0.173 (0.121) C:NA T:77%	pCi/g	07/27/16 09:34		N2

Sample: N002-CC002-01 Lab ID: 30189561004 Collected: 07/10/16 11:00 Received: 07/13/16 10:40 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	0.80613J ± 1.123 (1.799) C:NA T:NA	pCi/g	08/09/16 10:50	14913-49-6	
Lead-210	EPA 901.1	1.3329J ± 1.971 (2.557) C:NA T:NA	pCi/g	08/09/16 10:50	14255-04-0	
Lead-212	EPA 901.1	0.492 ± 0.173 (0.196) C:NA T:NA	pCi/g	08/09/16 10:50	15092-94-1	
Potassium-40	EPA 901.1	8.570 ± 2.259 (1.134) C:NA T:NA	pCi/g	08/09/16 10:50	13966-00-2	
Radium-226	EPA 901.1	0.670 ± 0.184 (0.216) C:NA T:NA	pCi/g	08/09/16 10:50	13982-63-3	
Radium-228	EPA 901.1	0.37725J ± 0.248 (0.539) C:NA T:NA	pCi/g	08/09/16 10:50	15262-20-1	
Thallium-208	EPA 901.1	0.139 ± 0.112 (0.123) C:NA T:NA	pCi/g	08/09/16 10:50	14913-50-9	
Thorium-234	EPA 901.1	1.2016J ± 1.434 (1.938) C:NA T:NA	pCi/g	08/09/16 10:50	15065-10-8	
Uranium-235	EPA 901.1	0.05696J ± 0.103 (0.134) C:NA T:NA	pCi/g	08/09/16 10:50	15117-96-1	
Thorium-228	HSL-300	0.445 ± 0.174 (0.109) C:NA T:87%	pCi/g	07/28/16 08:00	14274-82-9	N2
Thorium-230	HSL-300	0.372 ± 0.168 (0.183) C:NA T:87%	pCi/g	07/28/16 08:00	14269-63-7	N2
Thorium-232	HSL-300	0.303 ± 0.136 (0.053) C:NA T:87%	pCi/g	07/28/16 08:00	7440-29-1	N2
U-233/234	HSL-300	0.510 ± 0.214 (0.148) C:NA T:84%	pCi/g	07/27/16 15:43		N2
U-235/236	HSL-300	0.013 ± 0.089 (0.147) C:NA T:84%	pCi/g	07/27/16 15:43		N2
Uranium-238	HSL-300	0.471 ± 0.201 (0.095) C:NA T:84%	pCi/g	07/27/16 15:43		N2

REPORT OF LABORATORY ANALYSIS



Project: 393
Pace Project No.: 30189561

Sample: N002-CC002-02 Lab ID: 30189561005 Collected: 07/10/16 11:05 Received: 07/13/16 10:40 Matrix: Solid

PWS: Site ID: Sample Type:

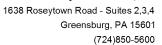
Results reported on a "dry-weight" basis

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	0.8899J ± 0.805 (2.105) C:NA T:NA	pCi/g	08/09/16 11:08	14913-49-6	
Lead-210	EPA 901.1	0U ± 1.981 (4.530) C:NA T:NA	pCi/g	08/09/16 11:08	14255-04-0	
Lead-212	EPA 901.1	0.427 ± 0.151 (0.144) C:NA T:NA	pCi/g	08/09/16 11:08	15092-94-1	
Potassium-40	EPA 901.1	8.453 ± 2.391 (1.327) C:NA T:NA	pCi/g	08/09/16 11:08	13966-00-2	
Radium-226	EPA 901.1	0.763 ± 0.209 (0.155) C:NA T:NA	pCi/g	08/09/16 11:08	13982-63-3	
Radium-228	EPA 901.1	0.49627J ± 0.313 (0.502) C:NA T:NA	pCi/g	08/09/16 11:08	15262-20-1	
Thallium-208	EPA 901.1	0.185 ± 0.090 (0.083) C:NA T:NA	pCi/g	08/09/16 11:08	14913-50-9	
Thorium-234	EPA 901.1	1.0617J ± 1.413 (2.201) C:NA T:NA	pCi/g	08/09/16 11:08	15065-10-8	
Uranium-235	EPA 901.1	0.042008U ± 0.122 (0.162) C:NA T:NA	pCi/g	08/09/16 11:08	15117-96-1	
Thorium-228	HSL-300	0.300 ± 0.162 (0.219) C:NA T:79%	pCi/g	07/28/16 08:00	14274-82-9	N2
Thorium-230	HSL-300	0.433 ± 0.175 (0.140) C:NA T:79%	pCi/g	07/28/16 08:00	14269-63-7	N2
Thorium-232	HSL-300	0.349 ± 0.149 (0.070) C:NA T:79%	pCi/g	07/28/16 08:00	7440-29-1	N2
U-233/234	HSL-300	0.489 ± 0.183 (0.160) C:NA T:91%	pCi/g	07/27/16 15:43		N2
U-235/236	HSL-300	0.009 ± 0.061 (0.084) C:NA T:91%	pCi/g	07/27/16 15:43		N2
Uranium-238	HSL-300	0.437 ± 0.162 (0.065) C:NA T:91%	pCi/g	07/27/16 15:43		N2

Sample: RB-N-160710 PWS:	Lab ID: 30189 Site ID:	O561006 Collected: 07/10/16 15:00 Sample Type:	Received:	07/13/16 10:40	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.130 ± 0.297 (0.699) C:NA T:99%	pCi/L	08/09/16 12:38	3 13982-63-3	
Radium-228	EPA 904.0	0.939 ± 0.408 (0.648) C:75% T:78%	pCi/L	08/08/16 21:19	9 15262-20-1	
Thorium-228	HSL-300	0.044 ± 0.057 (0.099) C:NA T:80%	pCi/L	08/01/16 19:53	3 14274-82-9	N2
Thorium-230	HSL-300	-0.123 ± 0.060 (0.188) C:NA T:80%	pCi/L	08/01/16 19:53	3 14269-63-7	N2
Thorium-232	HSL-300	0.000 ± 0.040 (0.026) C:NA T:80%	pCi/L	08/01/16 19:53	3 7440-29-1	N2
U-233/234	HSL-300	-0.156 ± 0.121 (0.441) C:NA T:83%	pCi/L	08/02/16 07:58	3	N2
U-235/236	HSL-300	0.042 ± 0.125 (0.094) C:NA T:83%	pCi/L	08/02/16 07:58	3	N2
Uranium-238	HSL-300	0.005 ± 0.096 (0.184) C:NA T:83%	pCi/L	08/02/16 07:58	3	N2

REPORT OF LABORATORY ANALYSIS





QUALITY CONTROL - RADIOCHEMISTRY

Project: 393
Pace Project No.: 30189561

QC Batch: 227833 Analysis Method: HSL-300

QC Batch Method: HSL-300 Analysis Description: HSL300(AS) Actinides

Associated Lab Samples: 30189561006

METHOD BLANK: 1116097 Matrix: Water

Associated Lab Samples: 30189561006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Thorium-228	0.064 ± 0.105 (0.197) C:NA T:78%	pCi/L	08/01/16 19:53	N2
Thorium-230	-0.022 ± 0.040 (0.108) C:NA T:78%	pCi/L	08/01/16 19:53	N2
Thorium-232	-0.006 ± 0.040 (0.063) C:NA T:78%	pCi/L	08/01/16 19:53	N2
U-233/234	0.090 ± 0.128 (0.248) C:NA T:74%	pCi/L	08/02/16 07:58	N2
U-235/236	-0.009 ± 0.131 (0.181) C:NA T:74%	pCi/L	08/02/16 07:58	N2
Uranium-238	0.077 ± 0.101 (0.139) C:NA T:74%	pCi/L	08/02/16 07:58	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS



Pace Analytical www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4 Greensburg, PA 15601 (724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project:

393

Pace Project No.:

30189561

QC Batch:

228578

Analysis Method:

EPA 903.1

QC Batch Method:

EPA 903.1

Analysis Description:

903.1 Radium-226

Associated Lab Samples:

30189561006

METHOD BLANK: 1119784

00001000

Matrix: Water

Associated Lab Samples:

30189561006

Parameter

Act ± Unc (MDC) Carr Trac

Units pCi/L Analyzed

Qualifiers

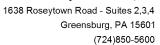
Radium-226

0.0658 ± 0.301 (0.611) C:NA T:105%

08/09/16 12:03

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS





QUALITY CONTROL - RADIOCHEMISTRY

Project: 393
Pace Project No.: 30189561

QC Batch: 226882 Analysis Method: HSL-300

QC Batch Method: HSL-300 Analysis Description: HSL300(AS) Actinides

Associated Lab Samples: 30189561001, 30189561002, 30189561003, 30189561004, 30189561005

METHOD BLANK: 1111723 Matrix: Solid

Associated Lab Samples: 30189561001, 30189561002, 30189561003, 30189561004, 30189561005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Thorium-228	0.023 ± 0.046 (0.097) C:NA T:82%	pCi/g	07/27/16 15:54	N2
Thorium-230	-0.038 ± 0.054 (0.177) C:NA T:82%	pCi/g	07/27/16 15:54	N2
Thorium-232	0.000 ± 0.046 (0.034) C:NA T:82%	pCi/g	07/27/16 15:54	N2
U-233/234	0.093 ± 0.095 (0.168) C:NA T:88%	pCi/g	07/27/16 15:39	N2
U-235/236	0.058 ± 0.069 (0.058) C:NA T:88%	pCi/g	07/27/16 15:39	N2
Uranium-238	-0.003 ± 0.052 (0.114) C:NA T:88%	pCi/g	07/27/16 15:39	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS



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QUALITY CONTROL - RADIOCHEMISTRY

Project: 393
Pace Project No.: 30189561

QC Batch: 226931 Analysis Method: EPA 901.1

QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec Ingrowth

Associated Lab Samples: 30189561001, 30189561002, 30189561003, 30189561004, 30189561005

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS



1638 Roseytown Road - Suites 2,3,4 Greensburg, PA 15601 (724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project:

393

Pace Project No.:

30189561

227857

Analysis Method:

EPA 904.0

QC Batch Method:

QC Batch:

EPA 904.0

Analysis Description:

904.0 Radium 228

Associated Lab Samples:

30189561006

Matrix: Water

Associated Lab Samples:

METHOD BLANK: 1116126

Parameter

30189561006

Act ± Unc (MDC) Carr Trac

Units

Analyzed

Qualifiers

Radium-228

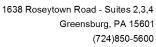
0.487 ± 0.326 (0.613) C:78% T:86%

pCi/L

08/08/16 21:16

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS





QUALIFIERS

Project: 393
Pace Project No.: 30189561

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval) (MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 08/09/2016 02:32 PM

N2 The lab does not hold TNI accreditation for this parameter.

REPORT OF LABORATORY ANALYSIS

Weston Solutions, Inc.

DateShipped: 7/12/2016 CarrierName: FedEx

AirbillNo: 7767 2667 1046

CHAIN OF CUSTODY RECORD

Case #: 393

Contact Name: Peter Lisichenko Contact Phone: 603-512-4350 No: 2-071216-140039-0001

Cooler#: 1 oF 2

Lab: PACE Analytical Services Lab Phone: 724-850-5600

Lab#	Sample #	Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Lab QC
	N002-BKF001-01	Office	Gamma Spec (Modified), Isotopic Th and U	P-Gravel	7/11/2016	09:00	1	Ziploc Bag	None	N COI
	N002-BKF002-01	NA	Gamma Spec (Modified), Isotopic Th and U	Gravel	7/12/2016	13:46	1	Ziploc Bag	None	N
	N002-CC001-01	N002-SB001	Gamma Spec (Modified), Isotopic Th and U	Concrete	7/10/2016	14:00	1	Ziploc Bag	None	Y COS
	N002-CC002-01	N002-SB003	Gamma Spec (Modified), Isotopic Th and U	Concrete	7/10/2016	11:00	2	Ziploc Bag	None 7	WW W
	N002-CC002-02	N002-SB002	Gamma Spec (Modified), Isotopic Th and U	Concrete	7/10/2016	11:05	1	Ziploc Bag	None	N COS
	RB-N-160710	NA .	Isotopic Thorium and Uranium	DI Water	7/10/2016	15:00	1	1 L Amber	HNO3 pH<2	Naci
	RB-N-160710	NA	Radium-226	DI Water	7/10/2016	15:00	1	1 L Poly	HNO3 pH<2	N
	RB-N-160710	NA	Radium-228	DI Water	7/10/2016	15:00	1	1 L Poly	HNO3 pH<2	N
	279		1 to the							
			The formal war.				\pm WO	#:3018	39561	
							+			

Special Instructions: Gamma Spectroscopy analysis for concrete samples to include: Ra-226 (in-growth), Ra-226 (186kev peak) Ra-228, K-40, TI-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL SAMPLES/	Math 1	2/12/11	Bus Menter	S 100 16 100	2 = -1
ALL ANALYSIS	PERTURY WESTON	7/12/14/14000	Ben Muuntun	1-13-1610:4	O GOOD
		ADDIOLOGO PROPERTOR AND ADDIOLOGO PROPERTOR ADDIOL			

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		- Salaharaharaharaharaharaharaharaharaharah			
		<u> </u>	**************************************		

Page 21 of 22

Sample Condition Upon Receipt Pittsburgh

Pace Analytical Client Name:	<u>w</u>	es	to	Λ	Project #_	3018956		
Courier: Fed Ex UPS USPS Clien Tracking #: 1767 2667 1046	i 00	-		Pace Other _				
Custody Seal on Cooler/Box Present: yes	•							
Thermometer Used				Blue (None)	°C Final 7	Comp. °C		
Cooler Temperature Observed Temp	<u> </u>	- ~	Corre	ection ractor.	- I II (a) I	omp.		
Temp should be above freezing to 6°C					Date and ir	nitials of person examining		
Comments:	Yes	No	N/A	1	contents	13000		
Chain of Custody Present:				1.				
Chain of Custody Filled Out:	17			2.				
Chain of Custody Relinquished:	17			3.				
Sampler Name & Signature on COC:				4.				
Sample Labels match COC:				5. NO TIME	2 on So	umples		
-Includes date/time/ID/Analysis Matrix:	501	WT						
Samples Arrived within Hold Time:				6.				
Short Hold Time Analysis (<72hr remaining):				7.				
Rush Turn Around Time Requested:				8.				
Sufficient Volume:		_		9.				
Correct Containers Used:				10.				
-Pace Containers Used:								
Containers Intact:				11.				
Filtered volume received for Dissolved tests				12.				
All containers needing preservation have been checked.	/			13. Dh 12				
All containers needing preservation are found to be in compliance with EPA recommendation.				1110				
•				Initial when completed BM	Date/time of preservation			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Lot # of added				
	т—	T		preservative				
Headspace in VOA Vials (>6mm):	<u> </u>		/	14.				
Trip Blank Present:	 		//	15.				
Trip Blank Custody Seals Present	<u></u>	<u> </u>	<u> </u>					
Client Notification/ Resolution:								
Person Contacted:			Date/	Time:	Contac	ted By:		
Comments/ Resolution:								
		w						
					· · · · · · · · · · · · · · · · · · ·			

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)